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Asset Pricing in a Production Economy

(Dissertation)

I study the effects of several features in a DSGE model of a production economy on the model's ability to account for data on asset prices. The first chapter investigates the joint behavior of consumption and asset returns. Bansal and Yaron (2004) assume a Markov endowment process that includes a small persistent shock to the growth rates of consumption and dividends (long-run risk) as well as a similar shock to the volatility of consumption and dividends (stochastic volatility). I estimate the parameters of a similar process and provide evidence that both long-run risk and stochastic volatility exist in the data on consumption and equity returns.

Next, I estimate a DSGE model of a production economy by Indirect Inference using the estimated Markov process for consumption and equity returns as my auxiliary model. This model contains both long-run risk and stochastic volatility in aggregate productivity and rare disasters that occur with time-varying probability. The model is able to account for the low return on the risk-free asset as well as the large equity premium. However, I show that this model is not able to account for the fact that equity returns are about 20 times more volatile than consumption without the addition of financial leverage.

In the second chapter of my dissertation, I take advantage of the fact that my model nests within it several simpler models. By fixing the value of different parameters, I shut down the long-run risk, stochastic volatility, and rare disasters one by one. By using the reduced form parameters of my previous auxiliary model, in addition to several other asset-pricing moments, I conduct tests for overidentifying restrictions to assess each model specification's ability to fit the asset price data. In this way, I examine the relative importance of the model's key features.

In the third chapter, I use the estimated DSGE model of a production economy to perform a counterfactual analysis. I examine the welfare cost of business cycles that is implied by my model. How much consumption would the representative agent be willing to give up in order to eliminate the shocks to the level or the shocks to the growth rate of aggregate productivity?

JEL: E13, E32, E44

Keywords: asset pricing, production economy, long-run risk, stochastic volatility, rare disasters